



The Scientific Character Virtues: An Interdisciplinary Study

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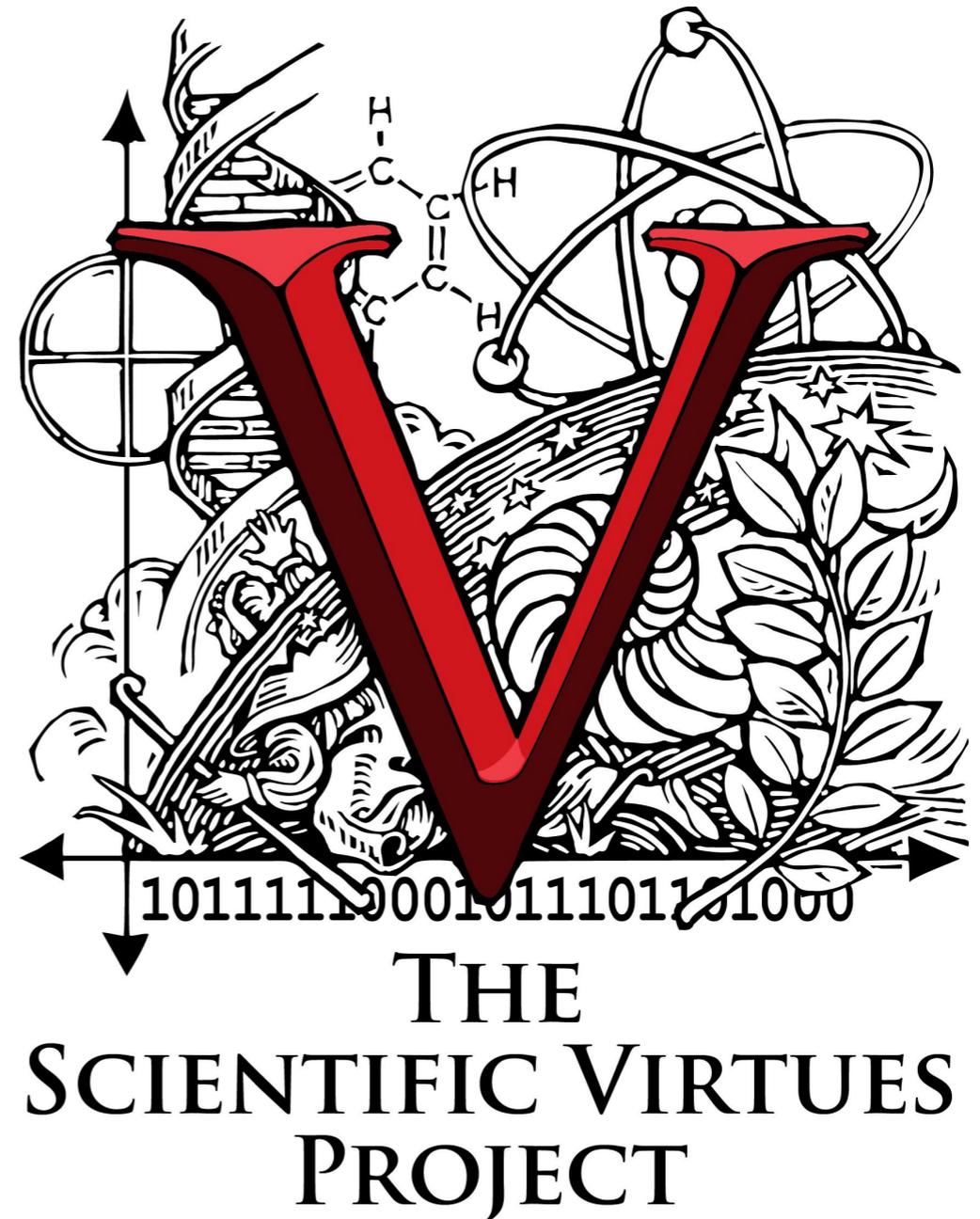
Ecology, Evolutionary Biology and Behavior Graduate Program

BEACON Center for the Study of Evolution in Action

Michigan State University

The Scientific Character Virtues

- Theoretical
 - Philosophical & historical account of the scientific disciplinary virtues
- Empirical
 - Formal study of scientists' ethical perceptions and stories
- Practical
 - Creation of SV-based science and RCR training curriculum



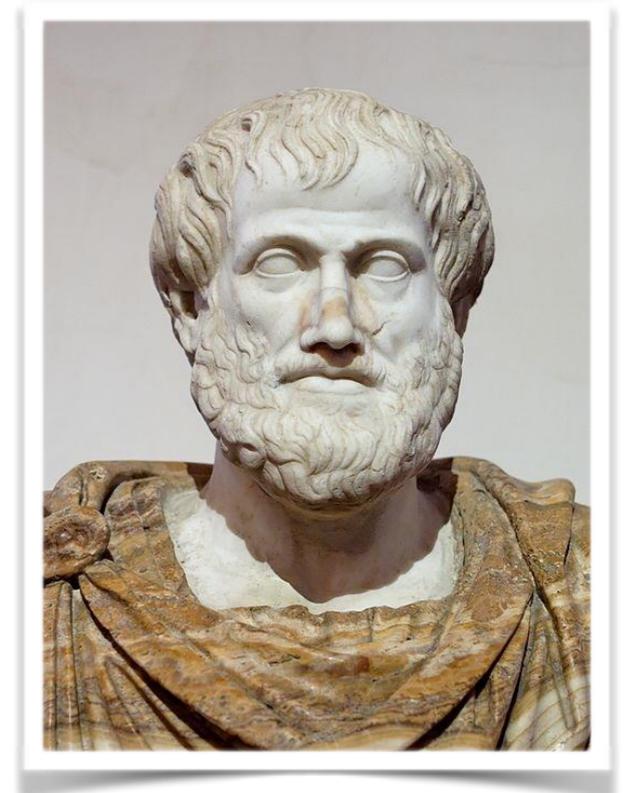
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Virtue Theory

- “[A] settled disposition of the mind that determines our choice of actions and emotions...” - Aristotle
- Classical “Cardinal” Virtues
 - Prudence
 - Justice
 - Temperance
 - Courage
- Moderation distinguishes virtue from vice





The Scientific Character

From Philosophy of Science
to Philosophy of the Scientist



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What Possible Scientific Virtues?

- Philosophical theory & historical background
- Informal interviews
- Open ended questions
- Pilot survey narrowed list to 25 possible virtues

How important are the following traits as descriptive of the character of the *exemplary* scientist?

	Irrelevant ----- Essential											Not Sure	Term too vague
	0	1	2	3	4	5	6	7	8	9	10		
Attentiveness	0	1	2	3	4	5	6	7	8	9	10	NS	V
Cleanliness	0	1	2	3	4	5	6	7	8	9	10	NS	V
Communal	0	1	2	3	4	5	6	7	8	9	10	NS	V
Cooperative	0	1	2	3	4	5	6	7	8	9	10	NS	V
Creativity	0	1	2	3	4	5	6	7	8	9	10	NS	V



Endorsement of Scientific Virtues by Exemplary Scientists

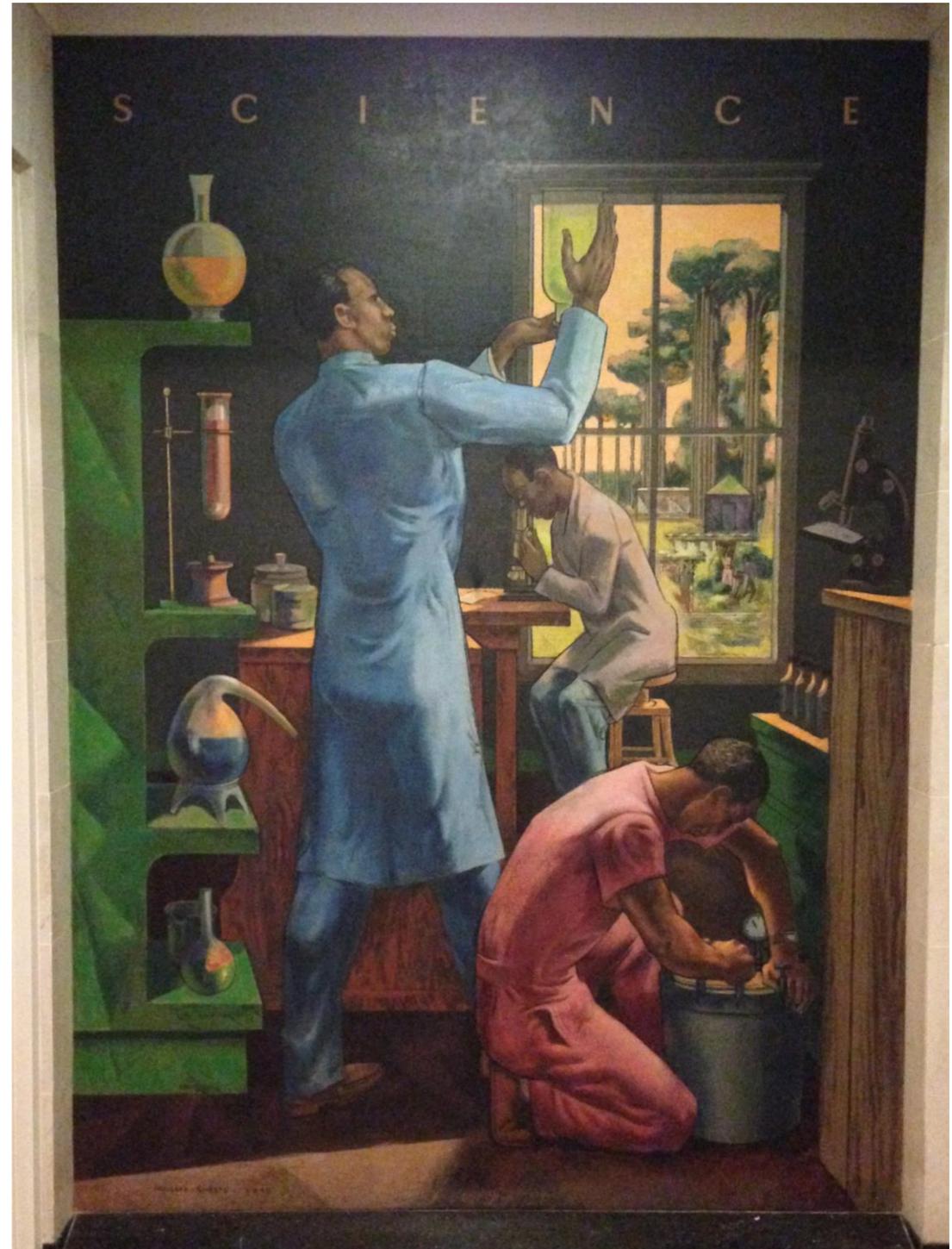
Scientific Virtues	Mean
Honesty	9.7
Curiosity	9.4
Attentiveness or observant	8.8
Perseverance or patience	8.6
Objectivity	8.6
Humility to evidence	8.6
Skepticism	8.1
Meticulousness	7.5
Courage	7.2
Collaborative	6.4

N = 481

(Pennock & Miller – preliminary data analysis)

In judging whether to take on some prospective graduate student or post-doc, do you look primarily at their academic record or do you also try to judge what scientific character traits that they have, positive or negative, in making your decision?

12% - Academic record
88% - Character traits



Do you think that
exemplary scientific
values and virtues – the
kinds of traits on our list
– can be learned?

94% - Yes



The Reign of Science - Karl Konrad Huber

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Responsible Conduct of Research

Traditional vs. Virtue-based Approach

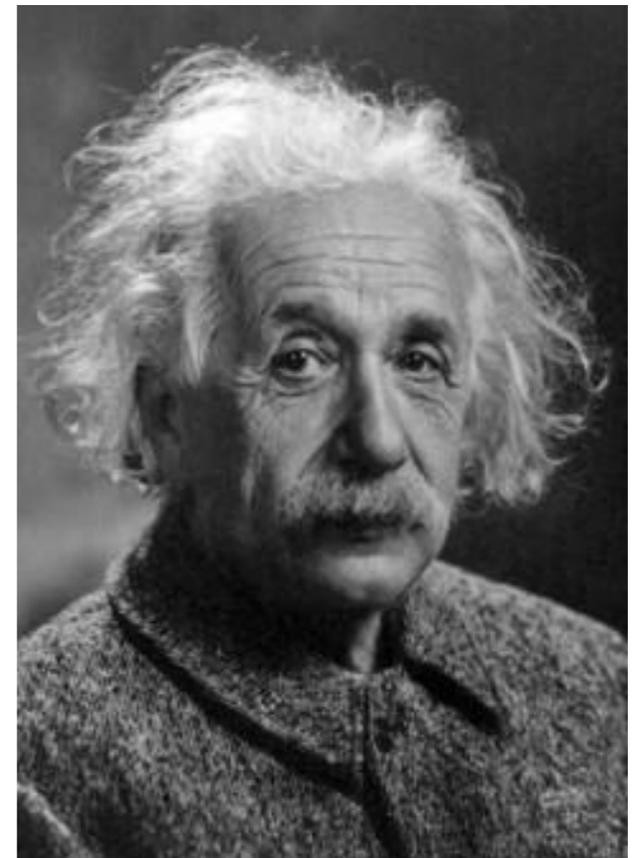


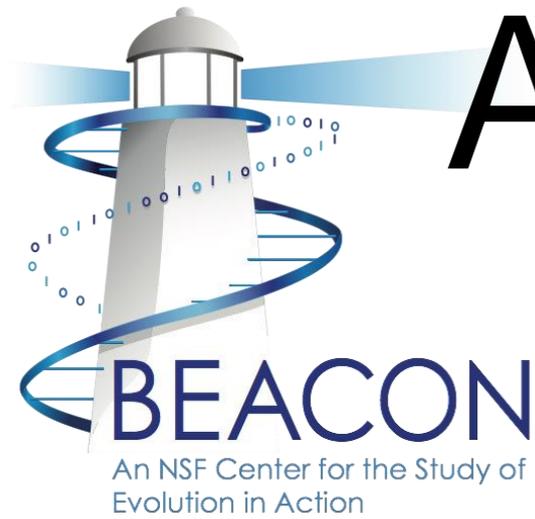
STEM Education

Cultivating Curiosity and Scientific Values

“Most people say that it is the intellect which makes a great scientist. They are wrong: it is character.”

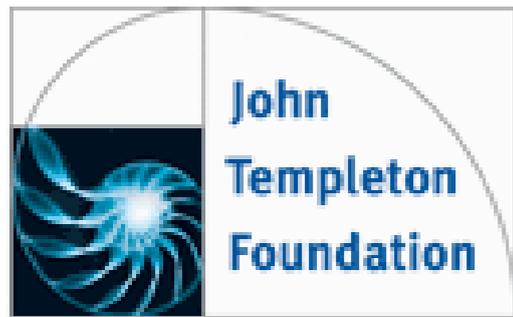
- Albert Einstein





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